

CLAIMS

What is claimed is:

1. An instrument panel comprising:
at least one instrument indicator positioned in the panel; and
5 at least one active display positioned in the panel capable of displaying
images from data provided to the display.
2. The panel of Claim 1 in which the images are changeable.
3. The panel of Claim 2 in which the images include icons.
4. The panel of Claim 2 in which the images include video images.
- 10 5. The panel of Claim 2 in which the images include animation.
6. The panel of Claim 2 in which the images provide instrument information.
7. The panel of Claim 1 in which said at least one active display has a liquid crystal
display.
8. The panel of Claim 7 in which said at least one active display has a screen onto
15 which images are projected from the liquid crystal display.
9. The panel of Claim 8 in which said at least one active display has at least one
light source for illuminating the liquid crystal display.
10. The panel of Claim 9 in which the at least one light source is at least one LED.

11. The panel of Claim 10 in which said LED is positioned near a hollow lens, the hollow lens for collecting light emitted by the LED and directing the collected light to the liquid crystal display.
12. The panel of Claim 1 in which the at least one instrument indicator and the at least one active display in the instrument panel are simultaneously displayed by an active display system.
13. The panel of Claim 12 in which the active display system comprises an arrangement of multiple active display devices.
14. The panel of Claim 1 in which the instrument panel is a vehicle display panel.
15. The panel of Claim 14 in which the instrument panel is a dashboard panel in a motor vehicle.
16. A display system comprising:
 - a display device for providing images;
 - a first light source for emitting light;
 - a first light collection lens system comprising a hollow lens for collecting the light emitted from the first light source and directing the light in a first beam of light to the display device for illuminating the images on the display device for viewing.
17. The display system of Claim 16 in which the display device is an active liquid crystal display.
18. The display system of Claim 17 in which the first light source is an LED.

19. The display system of Claim 18 in which the hollow lens is substantially spherical with an opening on one side.
20. The display system of Claim 19 in which the hollow lens has spherically shaped inner and outer surfaces with centers that can be offset from each other.
- 5 21. The display system of Claim 20 further comprising a projection lens for projecting images from the liquid crystal display.
22. The display system of Claim 21 further comprising a screen for displaying the images projected by the projection lens.
23. The display system of Claim 22 in which the first light collection lens system
10 further comprises a condenser lens positioned adjacent to the hollow lens for further condensing the first beam of light.
24. The display system of Claim 23 further comprising a dispersion lens positioned adjacent to the liquid crystal display for dispersing the first beam of light on the liquid crystal display.
- 15 25. The display system of Claim 24 further comprising:
 - a second light source comprising an LED for emitting light, the light from the first and second light sources being different colors;
 - a second light collection lens system comprising a hollow lens for collecting the light emitted from the second light source and directing the light in
20 a second beam of light, and a condenser lens positioned adjacent to the hollow lens for further condensing the second beam of light; and
 - a beam splitter for directing the second beam of light through the dispersion lens to the liquid crystal display.

26. The display system of Claim 25 further comprising a mirror for directing images projected by the projection lens onto the screen.
27. The display system of Claim 25 in which one of the first and second light sources emits green light at about 530 nm and the other emits red light at about 645 nm.
28. The display system of Claim 25 in which the display system is contained within a housing, the housing being about 3.5 inches long, 1.5 inches high and 1 inch wide.
29. The display system of Claim 28 in which the screen is about 1 x 1.3 inches and the displayed images have a dimension of at least 3 x 4 inches.
30. The display system of Claim 25 further comprising:
a third light source comprising an LED for emitting light, the light from the first, second and third light sources being different colors;
a third light collection lens system comprising a hollow lens for collecting the light emitted from the third light source and directing the light in a third beam of light, and a condenser lens positioned adjacent to the hollow lens for further condensing the third beam of light; and
wherein the beam splitter also directs the third beam of light through the dispersion lens to the liquid crystal display.
31. The display system of Claim 30 in which the different colors are green, red and blue.

32. A method of actively displaying images in an instrument panel having at least one instrument indicator positioned in the panel comprising:
providing at least one active display positioned in the panel; and
displaying images on the active display from data provided to the
5 display.
33. The panel of Claim 32 further comprising changing the displayed images.
34. The method of Claim 33 further comprising displaying icons.
35. The method of Claim 33 further comprising displaying video images.
36. The method of Claim 33 further comprising providing the images with
10 animation.
37. The method of Claim 33 further comprising displaying instrument information.
38. The method of Claim 32 providing at least one active display with a liquid crystal display.
39. The method of Claim 38 further comprising projecting the images from the
15 liquid crystal display into a screen.
40. The method of Claim 39 further comprising illuminating the liquid crystal display with at least one light source.
41. The method of Claim 40 further comprising forming the at least one light source from at least one LED.

42. The method of Claim 41 further comprising positioning said LED near a hollow lens, the hollow lens for collecting light emitted by the LED and directing the collected light to the liquid crystal display.
43. The method of Claim 32 further comprising simultaneously displaying the at least one instrument indicator and the at least one active display in the instrument panel with an active display system.
44. The method of Claim 43 further comprising forming the active display system from an arrangement of multiple active display devices.
45. The method of Claim 32 further comprising forming the instrument panel as a vehicle display panel.
46. The method of Claim 45 further comprising forming the instrument panel as a dashboard panel in a motor vehicle.
47. A method of displaying images with a display system comprising:
providing the images with a display device;
emitting light with a first light source;
collecting the light emitted from the first light source and directing the light in a first beam of light to the display device with a first light collection lens system comprising a hollow lens for illuminating the images on the display device for viewing.
48. The method of Claim 47 further comprising providing the display device with an active liquid crystal display.

49. The method of Claim 48 further comprising forming the first light source from an LED.
50. The method of Claim 49 further comprising forming the hollow lens to be substantially spherical with an opening on one side.
- 5 51. The method of Claim 50 further comprising providing the hollow lens with spherically shaped inner and outer surfaces having centers that can be offset from each other.
52. The method of Claim 51 further comprising projecting images from the liquid crystal display with a projection lens.
- 10 53. The method of Claim 52 further comprising displaying the images projected by the projection lens on a screen.
54. The method of Claim 53 further comprising providing the first light collection lens system with a condenser lens positioned adjacent to the hollow lens for further condensing the first beam of light.
- 15 55. The method of Claim 54 further comprising positioning a dispersion lens adjacent to the liquid crystal display for dispersing the first beam of light on the liquid crystal display.
56. The method of Claim 55 further comprising:
emitting light with a second light source comprising an LED, the light
20 from the first and second light sources being different colors;
collecting the light emitted from the second light source and directing the light in a second beam of light with a second light collection lens system

comprising a hollow lens and a condenser lens positioned adjacent to the hollow lens for further condensing the second beam of light; and

directing the second beam of light through the dispersion lens to the liquid crystal display with a beam splitter.

- 5 57. The method of Claim 56 further comprising directing images projected by the projection lens onto the screen with a mirror.
58. The method of Claim 56 further comprising emitting green light at about 530 nm with one of the first and second light sources and emitting red light at about 645 nm with the other light source.
- 10 59. The method of Claim 56 further comprising containing the display system within a housing, the housing being about 3.5 inches long, 1.5 inches high and 1 inch wide.
60. The method of Claim 59 further comprising forming the screen to be about 1 x 1.3 inches and the displayed images having a dimension of at least 3 x 4 inches.
- 15 61. The method of Claim 56 further comprising:
 emitting light with a third light source comprising an LED, the light from the first, second and third light sources being different colors;
 collecting the light emitted from the third light source and directing the light in a third beam of light with a third light collection lens system comprising
20 a hollow lens and a condenser lens positioned adjacent to the hollow lens for further condensing the third beam of light; and
 directing the third beam of light through the dispersion lens to the liquid crystal display with the beam splitter.

62. The method of Claim 61 further comprising providing green, red and blue as the different colors.